AMENDMENTS TO THE CLAIMS

Claim 1 (canceled)

Claim 2 (currently amended): The pressure producing apparatus according to ~~claim 1~~ claim 20,

wherein the first electrodes and the second electrodes are embedded in said at least one of the first and second portions of the sheet member, such that the first electrodes and the second electrodes extend from ~~said one~~ an other of the first and second surfaces of the first and second portions of the sheet member in the direction of thickness thereof.

Claim 3 (currently amended): The pressure producing apparatus according to ~~claim 1~~ claim 20,

wherein a plurality of portions of said at least one of the first and second portions of the sheet member that are located between the plurality of first electrodes and the plurality of second electrodes are polarized in the surface direction so as to provide a plurality of active portions, and

wherein when ~~an~~ the electric field is applied to each of the active portions of the sheet member in a same direction as the direction of polarization of said each active portion, the sheet member is curved in the direction of thickness thereof because of ~~a~~ the difference between ~~an~~ the amount of elongation in the surface direction of ~~said one of~~ the first ~~and second portions~~ portion of the sheet member and ~~an~~ the amount of elongation in the surface direction of the ~~other of the first and~~ second ~~portions~~ portion of the sheet member.

Claim 4 (currently amended): The pressure producing apparatus according to ~~claim 1~~ claim 20, wherein the first and second electrodes are embedded in a limited portion of said at least one of the first and second portions of the sheet member that is limited in the surface direction.

Claim 5-6 (canceled)

Claim 7 (withdrawn - currently amended): The pressure producing apparatus according to claim 4,

wherein the sheet member has, in ~~said one~~ an other of the first and second surfaces thereof ~~that corresponds to said one of the first and second portions thereof~~, a plurality of recesses which cooperate with each other to at least partly surround the limited portion of said at least one of the first and second portions in which the first and second electrodes are provided.

Claim 8 (canceled)

Claim 9 (currently amended): The pressure producing apparatus according to ~~claim 8~~ claim 20,

wherein the first electrodes comprise a plurality of groups of first electrodes and the second electrodes comprise a plurality of groups of said second electrodes,

wherein the liquid-chamber defining member includes at least one partition wall which cooperates with said ~~other~~ one of the first and second surfaces of the sheet member to define a plurality of said liquid chambers in each of which the liquid is accommodated, and

wherein the plurality of groups of first electrodes and the plurality of groups of second electrodes are provided in a plurality of limited portions of said at least one of the first and second portions of the sheet member, respectively, that are aligned with the plurality of liquid chambers, respectively.

Claim 10 (currently amended): The pressure producing apparatus according to ~~claim 1~~ claim 20,

wherein the first portion of the sheet member comprises a first sheet member and the first electrodes are embedded in the first sheet member, wherein the second electrodes are embedded in the first sheet member, and

wherein the second portion of the sheet member comprises a second sheet member which is stacked on the first sheet member and resists elongation of the first sheet member in the surface direction that occurs when ~~an~~ the electric field is applied, in the surface direction, to a plurality of portions of the first sheet member that are located between the first electrodes and the second electrodes.

Claim 11 (withdrawn – previously presented): The pressure producing apparatus according to claim 10,

wherein the first electrodes and the second electrodes are embedded in the first sheet member such that the first electrodes and the second electrodes extend from the first surface of the first sheet member in a direction of thickness thereof.

Claim 12 (withdrawn – previously presented): The pressure producing apparatus according to claim 11,

wherein the first electrodes and the second electrodes extend through the thickness of the first sheet member.

Claim 13 (withdrawn – previously presented): The pressure producing apparatus according to claim 10, wherein the first electrodes and the second electrodes are embedded in a limited portion of the first sheet member that is limited in the surface direction.

Claim 14 (previously presented): The pressure producing apparatus according to claim 29,

wherein the first electrodes comprise a plurality of groups of first electrodes and the second electrodes comprise a plurality of groups of-second electrodes,

wherein the plurality of groups of first electrodes are arranged along a plurality of concentric first circles as a plurality of said first lines, respectively, and the plurality of groups of second electrodes are arranged along a plurality of concentric second circles as a plurality of said second lines, respectively, and

wherein the first and second circles are concentric with each other and the groups of first electrodes and the groups of second electrodes are alternate with each other in a radial direction of the concentric first and second circles.

Claim 15 (previously presented): The pressure producing apparatus according to claim 29,

wherein the first electrodes comprise a plurality of groups of said first electrodes and the second electrodes comprise a plurality of groups of second electrodes,

wherein the plurality of groups of first electrodes are arranged along a plurality of first straight lines as a plurality of said first lines, respectively, and the plurality of groups of second electrodes are arranged along a plurality of second straight lines as a plurality of said second lines, respectively, and

wherein the groups of first electrodes and the groups of second electrodes are alternate with each other in a direction intersecting the first and second straight lines.

Claim 16 (withdrawn): The pressure producing apparatus according to claim 13, wherein the first sheet member has, in the first surface thereof opposite to the second sheet member, a plurality of recesses which at least partly surround the limited portion of the first sheet member in which the first and second electrodes are embedded.

Claim 17 (withdrawn): The pressure producing apparatus according to claim 16,

wherein the plurality of recesses comprise a plurality of through-holes which are formed through the thickness of the first sheet member.

Claim 18 (withdrawn – currently amended): The pressure producing apparatus according to claim 10,~~ further comprising a~~

wherein the liquid-chamber defining member ~~which~~ cooperates with the second surface of the second sheet member that is opposite to the first sheet member to define ~~a~~ the liquid chamber in which ~~a~~ the liquid is accommodated, and

wherein the apparatus changes ~~a~~ the pressure of the liquid accommodated in the liquid chamber.

Claim 19 (withdrawn – currently amended): The pressure producing apparatus according to claim 18,

wherein the first electrodes comprise a plurality of groups of first electrodes and the second electrodes comprise a plurality of groups of second electrodes,

wherein the liquid-chamber defining member includes at least one partition wall which cooperates with the second surface of the second sheet member to define a plurality of said liquid chambers in each of which the liquid is accommodated, and

wherein the plurality of groups of first electrodes and the plurality of groups of second electrodes are provided in a plurality of limited portions of the first sheet member, respectively, that are aligned with the plurality of liquid chambers, respectively.

Claim 20 (previously presented): A pressure producing apparatus, comprising:

a sheet member which is formed of a piezoelectric material;

a plurality of first electrodes which are embedded in a first area of at least one of a first portion and a second portion of the sheet member, such that the first electrodes are separate from each other in the first area, the first portion and the second portion being opposite to each other in a direction of thickness of the sheet member;

a plurality of second electrodes which are embedded in a second area of said at least one of the first and second portions of the sheet member, such that the second electrodes are separate from each other in the second area, the second area being adjacent to the first area in a surface direction parallel to a first surface of the first portion and a second surface of the second portion that are opposite to each other in the direction of thickness of the sheet member; and

a liquid-chamber defining member which cooperates with one of the first and second surfaces of the sheet member to define a liquid chamber in which a liquid is accommodated,

wherein an electric field is applied between the first electrodes and the second electrodes, so as to produce a difference between an amount of elongation in the surface direction of the first portion of the sheet member and an amount of elongation in the surface direction of the second portion of the sheet member and thereby curve the sheet member in the direction of thickness thereof and change a pressure of the liquid accommodated in the liquid chamber.

Claim 21 (original): The pressure producing apparatus according to claim 20,

wherein the liquid chamber of the liquid-chamber defining member accommodates an ink as the liquid, and wherein the apparatus further comprises a nozzle-defining member which defines a nozzle which communicates with the liquid chamber and ejects a droplet of the ink when the sheet member is curved in the direction of thickness thereof to change the pressure of the ink accommodated in the liquid chamber.

Claim 22 (previously presented): The pressure producing apparatus accordingly to claim 20,

wherein the first portion and the second portion of the sheet member comprises a first sheet member and a second sheet member, respectively, which are stacked on each other, wherein the first electrodes are embedded in at least one of the first sheet member and the second sheet member,

wherein the second electrodes are embedded in said at least one of the first sheet member and the second sheet member, wherein the liquid-chamber defining member cooperates with one of the first and second surfaces of the first and second sheet members to define the liquid chamber in which the liquid is accommodated, and

wherein the electric field is applied between the one first electrodes and the second electrodes, so as to produce a difference between an amount of elongation in the surface direction of the first sheet member and an amount of elongation in the surface direction of the second sheet member and thereby curve the first and second sheet members in the respective directions of thickness thereof and change the pressure of the liquid accommodated in the liquid chamber.

Claim 23 (original): The pressure producing apparatus according to claim 22,

wherein the liquid chamber of the liquid-chamber defining member accommodates an ink as the liquid, and

wherein the apparatus further comprises a nozzle-defining member which defines a nozzle which communicates with the liquid chamber and ejects a droplet of the ink when the first and second sheet members are curved in the directions of thickness thereof to change the pressure of the ink accommodated in the liquid chamber.

Claim 24 (canceled)

Claim 25 (currently amended): The pressure producing apparatus according to ~~claim 24~~ claim 27,

wherein each of the plurality of first areas and the plurality of second areas has an elongate shape.

Claim 26 (currently amended): The pressure producing apparatus according to ~~claim 24~~ claim 27,

wherein each of the plurality of first areas and the plurality of second areas has an annular shape.

Claim 27 (previously presented): The pressure producing apparatus according to claim 20,

wherein the plurality of first electrodes comprise a plurality of groups of first electrodes each group of which include at least two first electrodes and are embedded in a corresponding one of a plurality of said first areas of said at least one of the first portion and the second portion of the sheet member, such that said at least two first electrodes are separate from each other in said corresponding first area, and the plurality of second electrodes comprise a plurality of groups of second electrodes each group of which includes at least two second electrodes and are embedded in a corresponding one of a plurality of said second areas of said at least one of the first and second portions of the sheet member, such that said at least two second electrodes are separate from each other in said corresponding second area, and wherein the plurality of first areas and the plurality of second areas are arranged alternately with each other in the surface direction.

Claim 28 (canceled)

Claim 29 (previously presented): The pressure producing apparatus according to claim 20, wherein the first electrodes are arranged along a first line in the first area and the second electrodes are arranged, in the second area, along a second line which is separate from, and opposed to, the first line in the surface direction.

Claim 30 (currently amended): The pressure producing apparatus according to ~~claim 1~~ claim 20,

wherein each of the first and second electrodes has a columnar shape having a substantially constant cross-section area in a direction parallel to an axis line thereof, and is embedded in said at least one of the first and second portions of the sheet member such that the axis line of said each electrode extends substantially parallel to the direction of thickness of the sheet member.

Claim 31 (currently amended): ~~The~~ A pressure producing apparatus ~~according to claim 30,~~ comprising:

a sheet member which is formed of a piezoelectric material;

a plurality of first electrodes which are embedded in a first area of one of a first portion and a second portion of the sheet member, such that the first electrodes are separate from each other in the first area, the first portion and the second portion being opposite to each other in a direction of thickness of the sheet member;

a plurality of second electrodes which are embedded in a second area of said one of the first and second portions of the sheet member, such that the second electrodes are separate from each other in the second area, the second area being adjacent to the first area in a surface direction parallel to one of a first surface of the first portion and a second surface of the second portion, the first surface and the second surface being opposite to each other in the direction of thickness of the sheet member, wherein each of the first and second electrodes has a columnar shape having a substantially constant cross-section area in a direction parallel to an axis line thereof, and is embedded in said one of the first and second portions of the sheet member such that the axis line of said each electrode extends substantially parallel to the direction of thickness of the sheet member, and

wherein said each of the first and second electrodes has a cylindrical shape as said columnar shape.

Claim 32 (currently amended): ~~A~~ The pressure producing apparatus~~, comprising:~~ according to claim 20, further comprising:

~~a sheet member which is formed of a piezoelectric material and which includes a first portion and a second portion that are opposite to each other in a direction of thickness of the sheet member and have a first surface and a second surface, respectively, that are opposite to each other in the direction of thickness of the sheet member;~~

~~a plurality of first electrodes which are embedded in one of the first portion and the second portion of the sheet member, such that the first electrodes are separate from each other and are arranged along a first line;~~

~~a plurality of second electrodes which are embedded in said one of the first and second portions of the sheet member, such that the second electrodes are separate from each other and are arranged along a second line which is separate from, and opposed to, the first line in a surface direction parallel to one of the first surface and the second surface of the sheet member;~~

a first wiring which electrically connects the first electrodes to each other and which is provided outside the sheet member; and

a second wiring which electrically connects the second electrodes to each other and which is provided outside the sheet member.

Claim 33 (currently amended): The pressure producing apparatus according to claim 32, wherein each of the first wiring and the second wiring is provided on ~~said one~~ an other of the first surface and the second surface of the sheet member.

Claim 34 (currently amended): ~~A~~ The pressure producing apparatus~~, comprising:~~ according to claim 20,

~~a sheet member which is formed of a piezoelectric material and which includes a first portion and a second portion that are opposite to each other in a direction of thickness of the sheet member and have a first surface and a second surface, respectively, that are opposite to each other in the direction of thickness of the sheet member;~~

wherein the plurality of first electrodes comprise at least three first electrodes which are embedded in said at least one of the first portion and the second portion of the sheet member, such that said at least three first electrodes are separate from each other and are arranged along a first line~~; and~~,

wherein the plurality of second electrodes comprise at least three second electrodes which are embedded in said at least one of the first and second portions of the sheet member, such that said at least three second electrodes are separate from each other and are arranged along a second line which is separate from, and opposed to, the first line in ~~a~~ the surface direction parallel to ~~one of~~ the first surface and the second surface of the sheet member~~[[;]]~~, and

wherein each of said at least three first electrodes and said at least three second electrodes has a columnar shape having a substantially constant cross-section area in a direction parallel to an axis line thereof, and is embedded in said at least one of the first and second portions of the sheet member such that the axis line of said each electrode extends substantially parallel to the direction of thickness of the sheet member.

Claim 35 (previously presented): The pressure producing apparatus according to claim 34, wherein at least six said first electrodes are arranged along at least two said first lines which are separate from each other in the surface direction, such that said at least three first electrodes are arranged along each of said at least two first lines, and at least six said second electrodes are arranged along at least two said second lines which are separate from, and alternate with, said at least two first lines in the surface direction, such that said at least three second electrodes are arranged along each of said at least two second lines; and

wherein each of said at least six first electrodes and said at least six second electrodes has the columnar shape.

Claim 36 (currently amended): ~~A~~ The pressure producing apparatus~~, comprising:~~ according to claim 20,

~~a sheet member which is formed of a piezoelectric material and which includes a first portion and a second portion that are opposite to each other in a direction of thickness of the sheet member and have a first surface and a second surface, respectively, that are opposite to each other in the direction of thickness of the sheet member;~~

wherein ~~a~~ the plurality of first electrodes ~~which~~ are embedded in said at least one of the first portion and the second portion of the sheet member, such that the first electrodes are separate from each other and are arranged along a plurality of first lines which are separate from each other in the surface direction as a first surface direction parallel to ~~one of~~ the first surface and the second surface of the sheet member~~; and~~,

wherein the ~~a~~ plurality of second electrodes ~~which~~ are embedded in said at least one of the first and second portions of the sheet member, such that the second electrodes are separate from each other and are arranged along a plurality of second lines which are separate from, and alternate with, the first lines in the first surface direction~~[[;]]~~,

wherein the first electrodes are arranged along a plurality of third lines which intersect the first lines and are separate from each other in a second surface direction that is parallel to

~~said one of~~ the first and second surfaces of the sheet member and intersects the first surface direction~~[[;]]~~, and

wherein the second electrodes are arranged along at least one fourth line which is separate from, and alternate with, the third lines in the second surface direction.

Claim 37 (previously presented): The pressure producing apparatus according to claim 36, wherein the first, second, third, and fourth lines are straight.

Claim 38 (currently amended): ~~The~~ A pressure producing apparatus ~~according to claim 36,~~ comprising:

a sheet member which is formed of a piezoelectric material and which includes a first portion and a second portion that are opposite to each other in a direction of thickness of the sheet member and have a first surface and a second surface, respectively, that are opposite to each other in the direction of thickness of the sheet member;

a plurality of first electrodes which are embedded in one of the first portion and the second portion of the sheet member, such that the first electrodes are separate from each other and are arranged along a plurality of first lines which are separate from each other in a first surface direction parallel to one of the first surface and the second surface of the sheet member; and

a plurality of second electrodes which are embedded in said one of the first and second portions of the sheet member, such that the second electrodes are separate from each other and are arranged along a plurality of second lines which are separate from, and alternate with, the first lines in the first surface direction,

wherein the first electrodes are arranged along a plurality of third lines which intersect the first lines and are separate from each other in a second surface direction that is parallel to said one of the first and second surfaces of the sheet member and intersects the first surface direction, wherein the second electrodes are arranged along at least one fourth line which is separate from, and alternate with, the third lines in the second surface direction, and

wherein the first and second lines are straight and are angularly separate from each other, and the third and fourth lines are circular and concentric with each other.